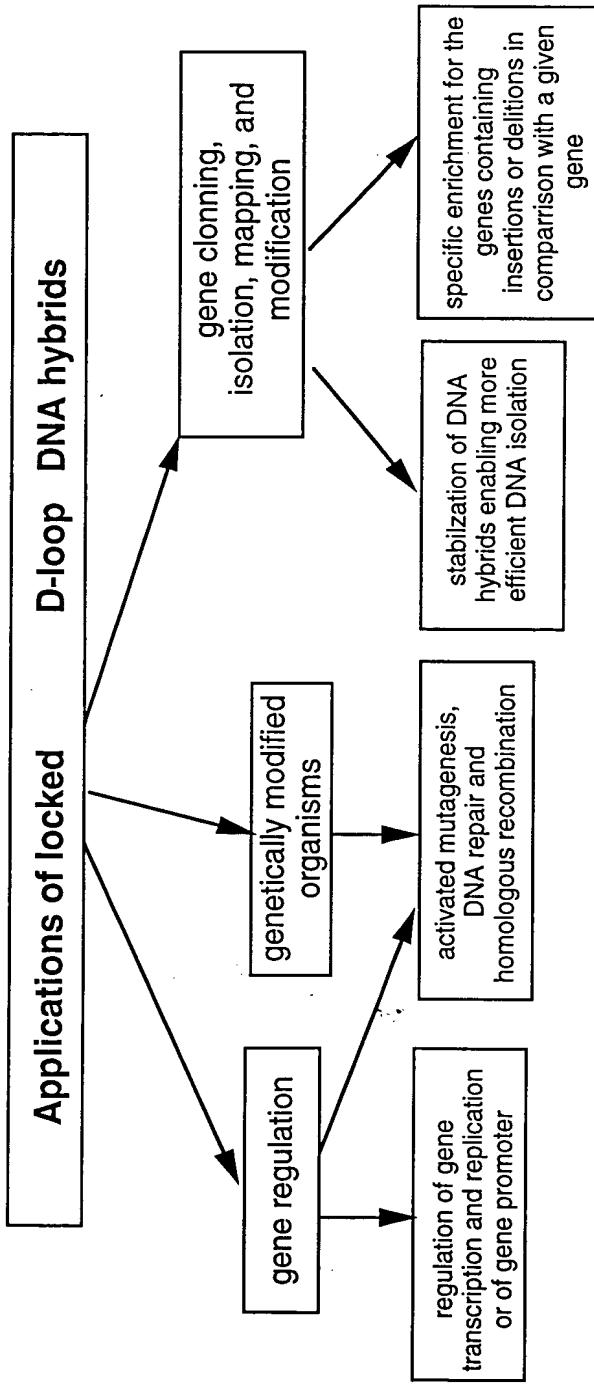
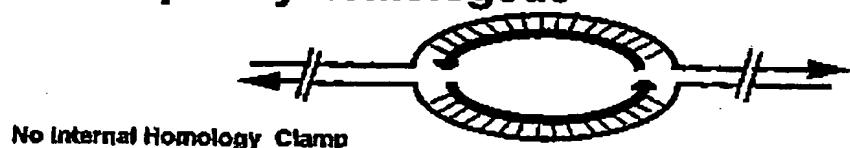


**FIGURE 1**



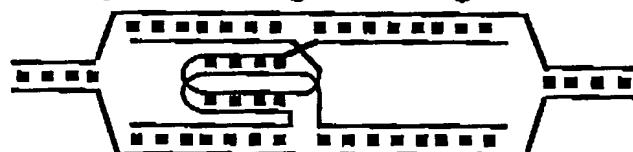
**FIGURE 2**

**A Target DNA completely homologous**



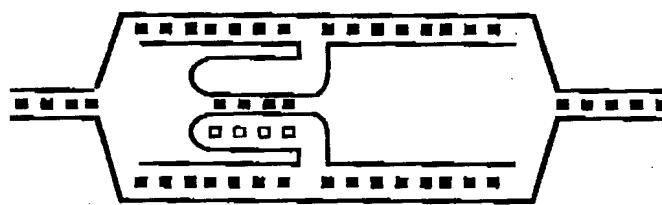
**duplex-forming heterologous insert**

**B**



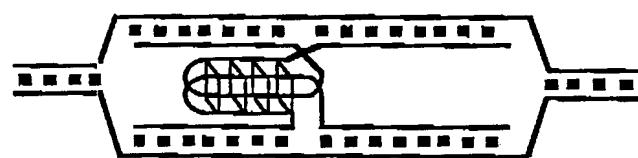
**triplex-forming heterologous insert**

**C**

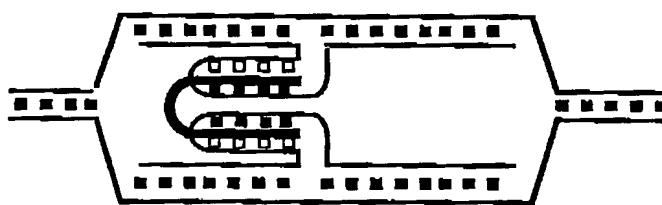


**quadruplex-forming heterologous insert**

**D**



**E heterologous insert which forms triplex with secondary probe**



**F Target DNA with an insertion**

**F**

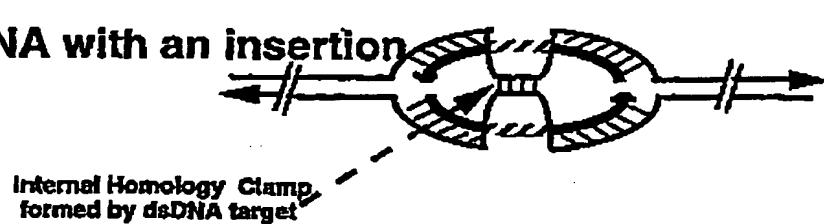


FIGURE 3

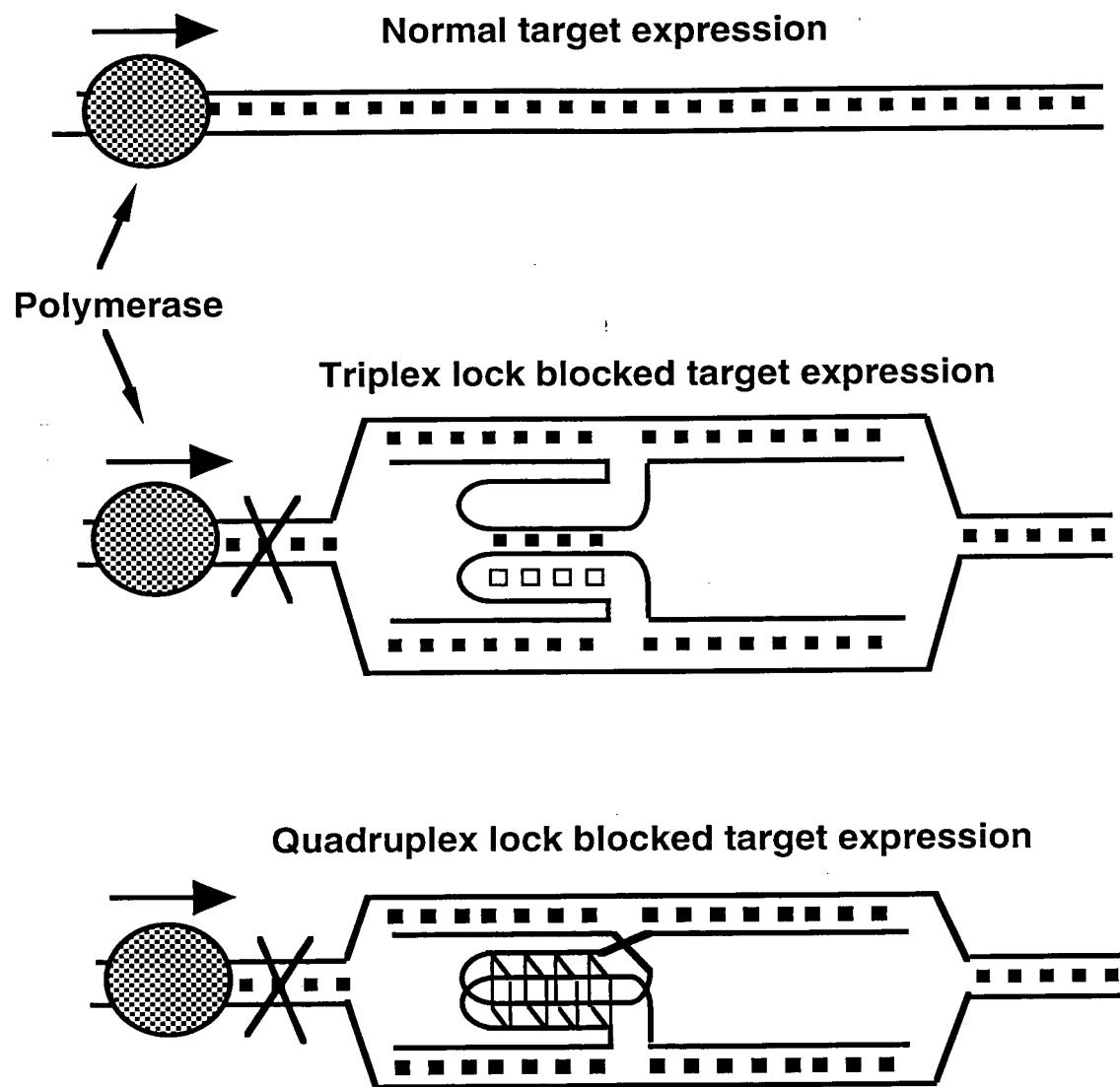
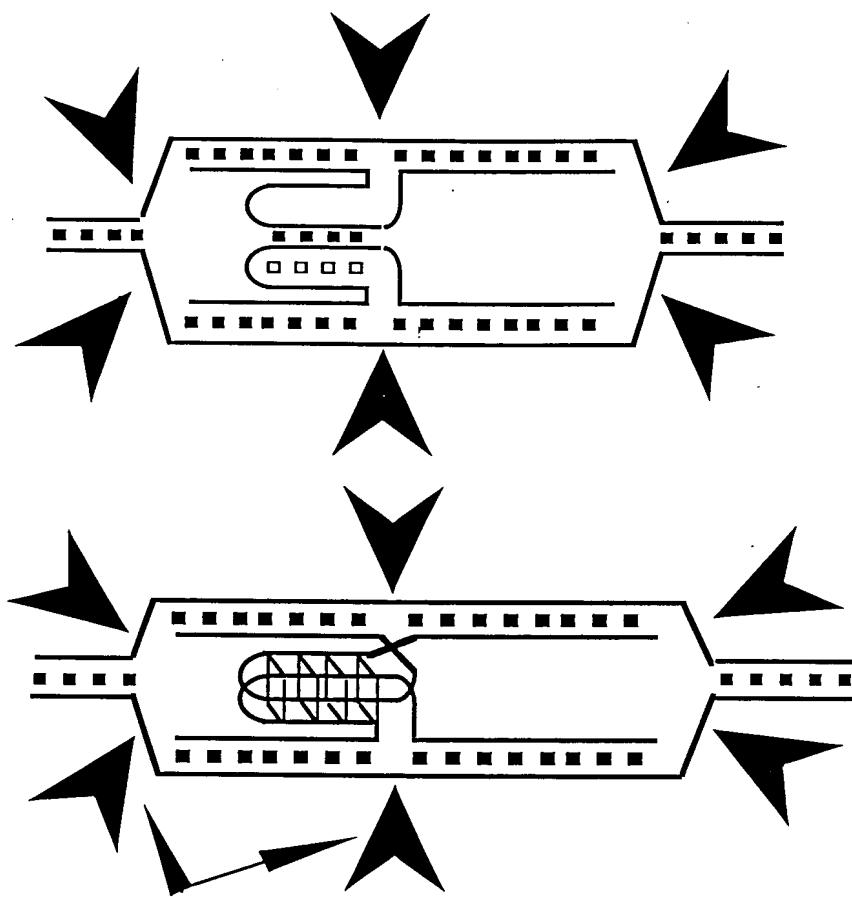
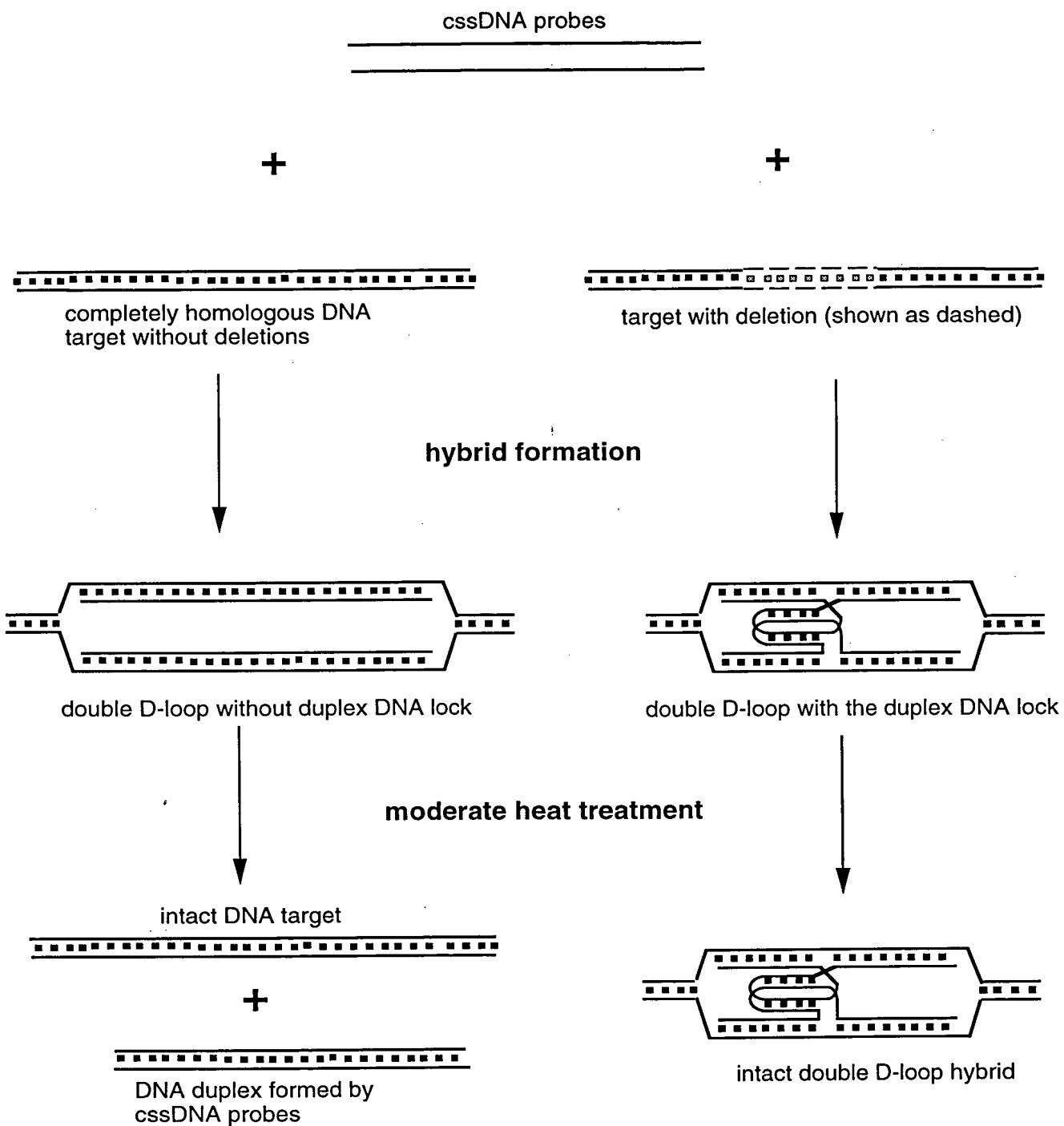


FIGURE 4

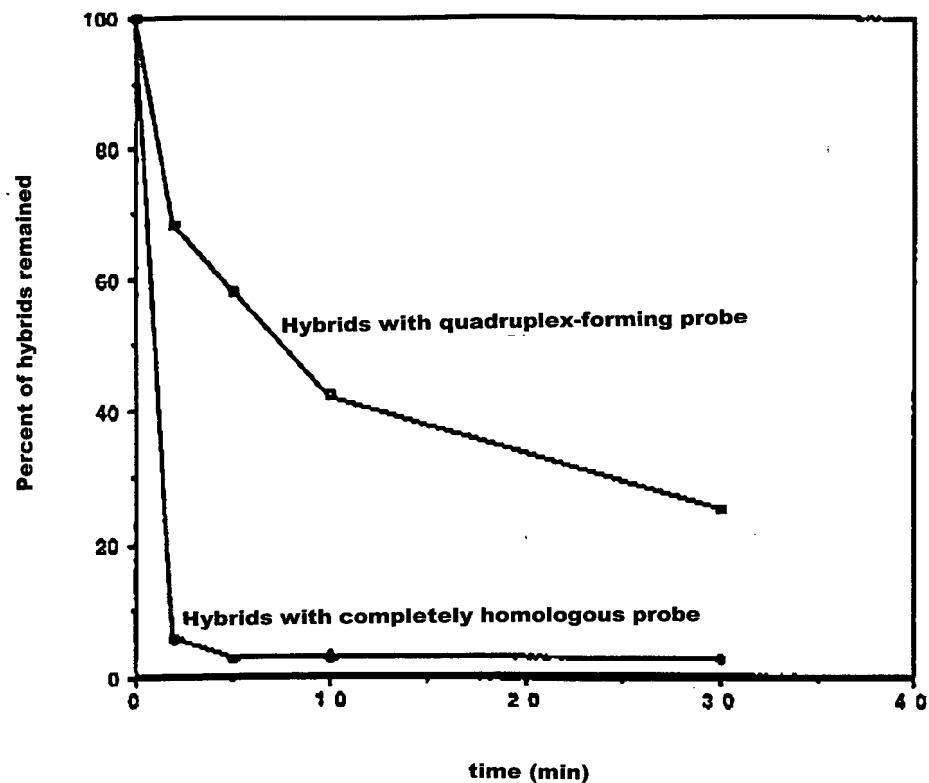


001240 " 242560  
**Hybrid recognition by  
nucleic acid repair,  
nucleic acid recombination,  
and resolution enzymes**

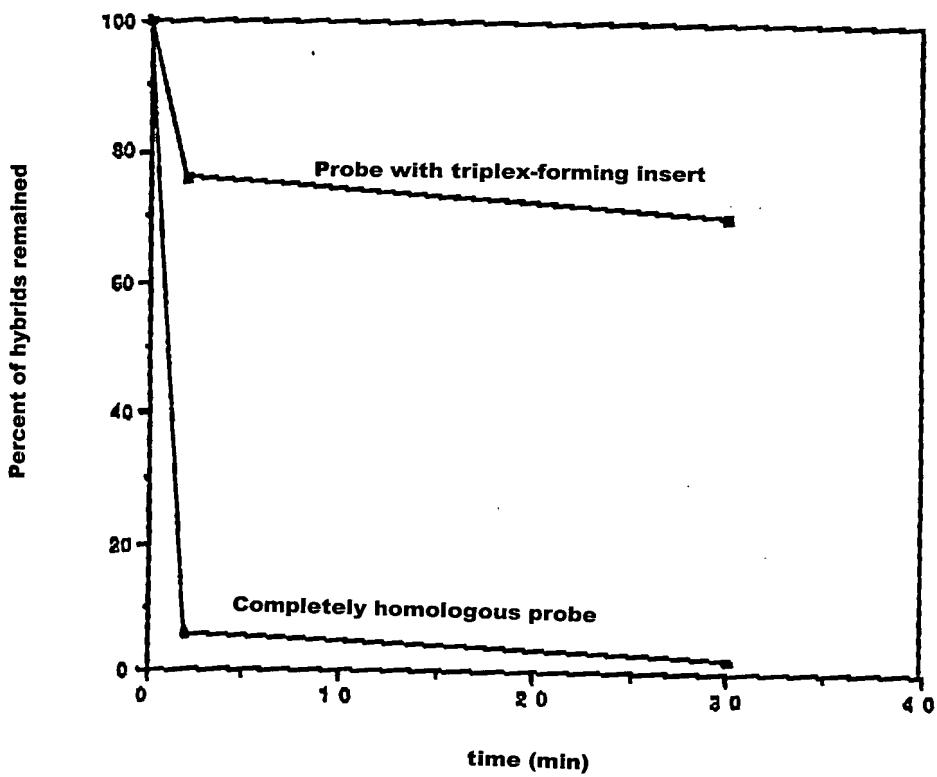
FIGURE 5



**FIGURE 6**



**FIGURE 7**



**FIGURE 8A**

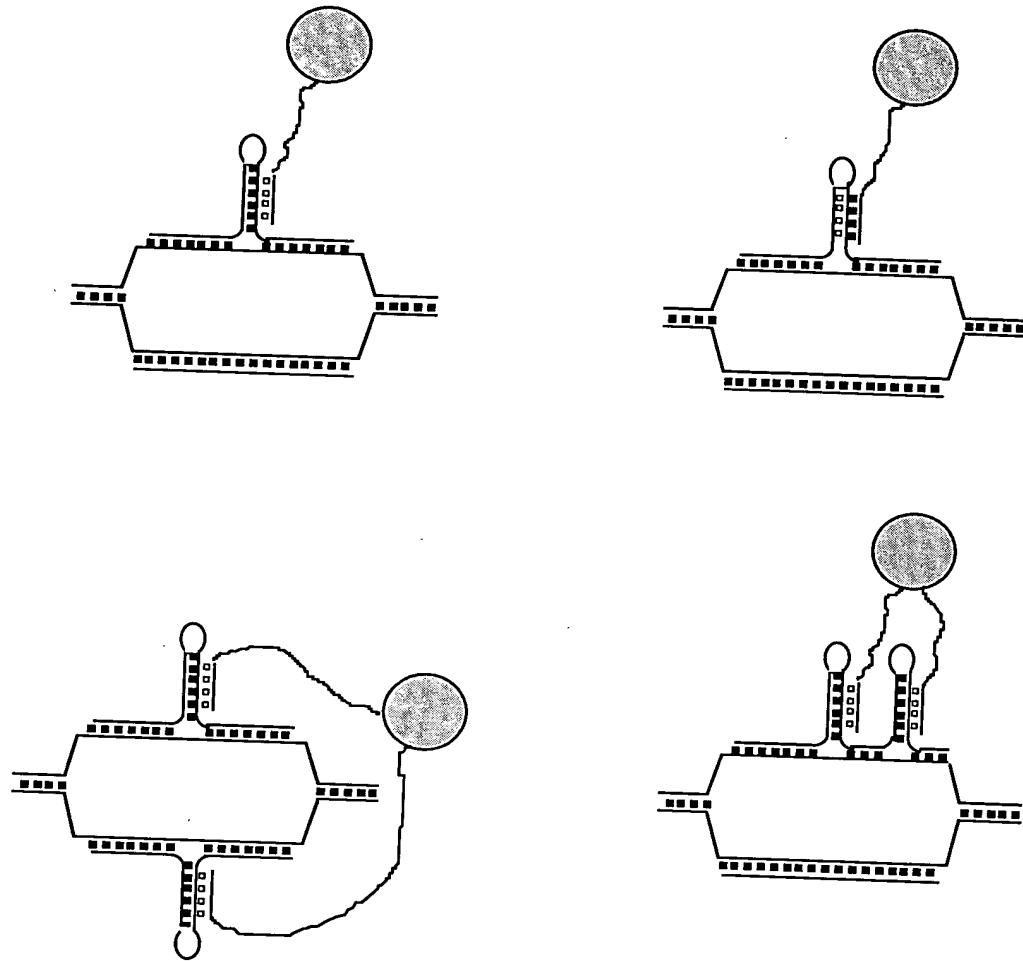
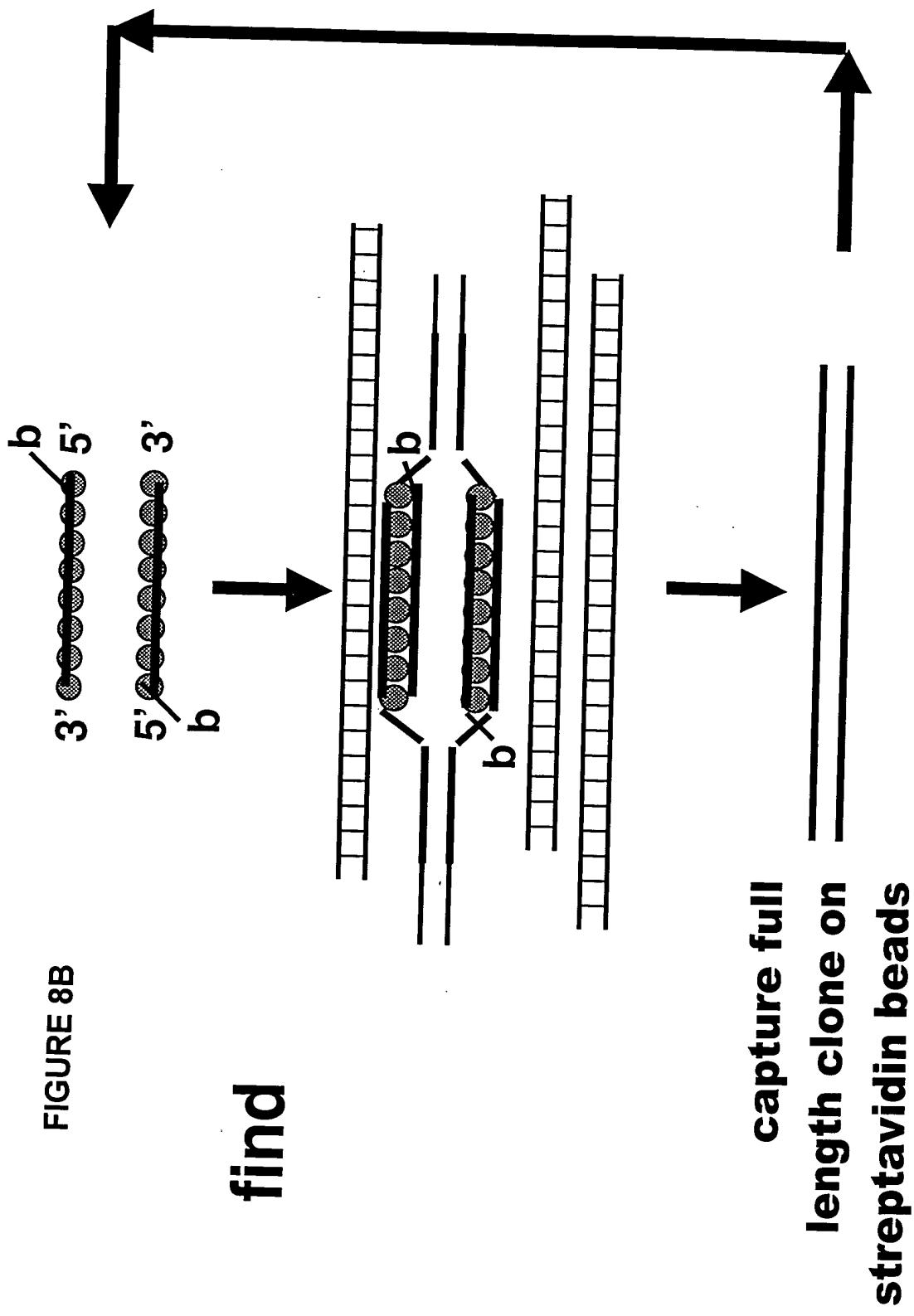
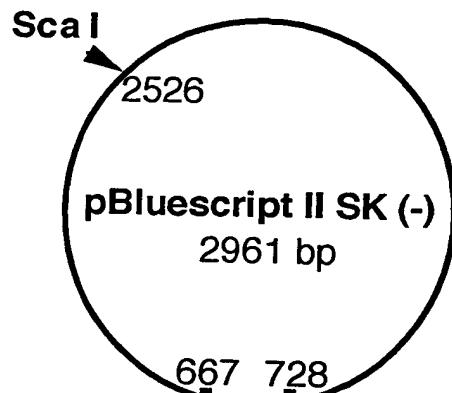


FIGURE 8B



**FIGURE 9**



**A.**

5' -CCTCGAGGTGACGGTATCGATAAGCTTGATATCGAATTCTGCAGCCGGGGATCCACTA-3' **NI<sub>W</sub>**  
3' -GGAGCTCCAGCTGCCATAGCTATTGAACTATAGCTTAAGGACGTCGGGCCCCCTAGGTGAT-b **NI<sub>C</sub>**

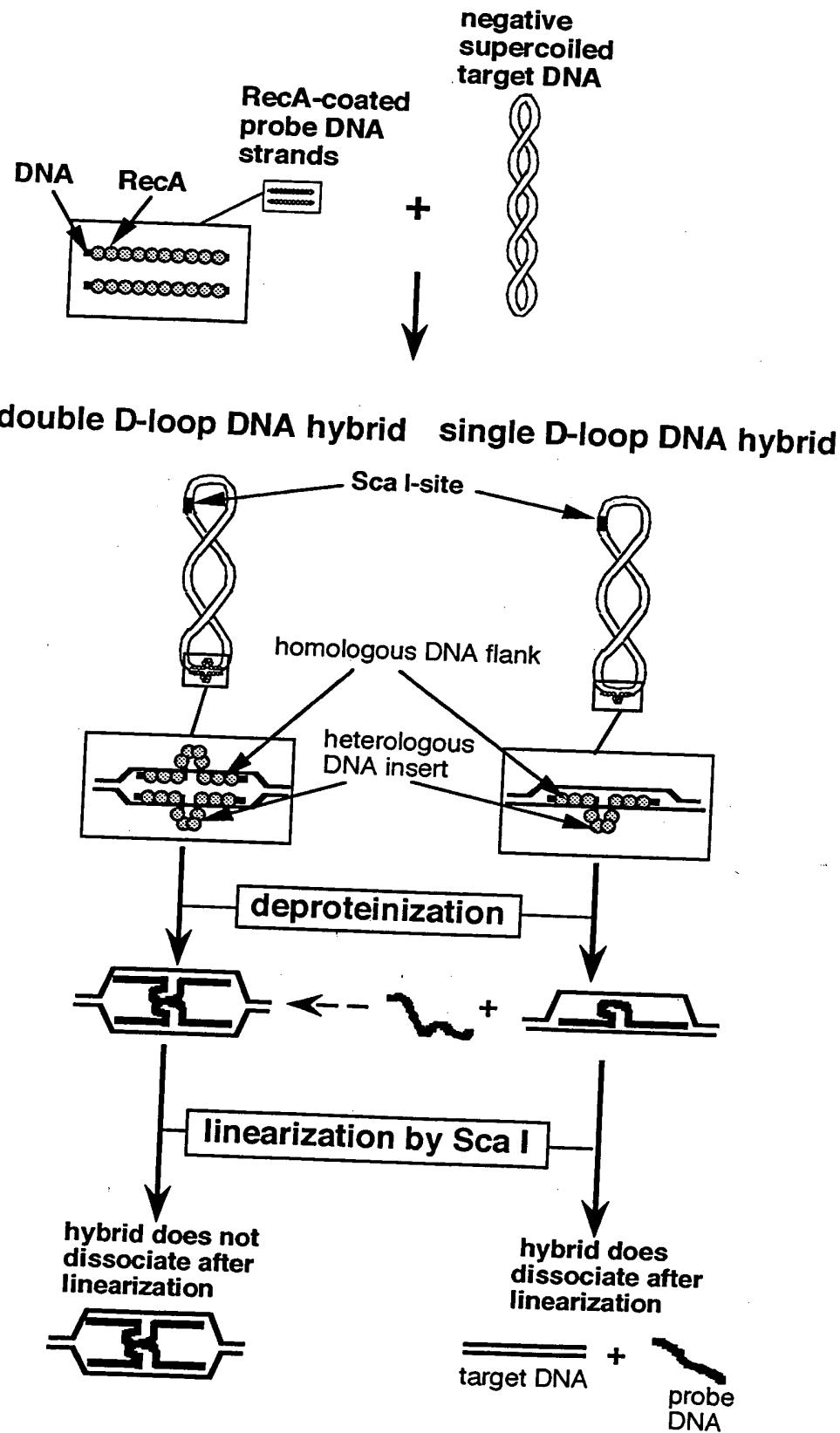
**B.**

5' -CCTCGAGGTGACGGTATCGATAAGCTTGAT**TGTGTGTGTGTGTGT**ATCGAATTCTGCAGCCGGGGATCCACTA-3' **ZI<sub>W</sub>**  
3' -GGAGCTCCAGCTGCCATAGCTATTGAACTA**ACACACACACACACACATAGCTTAAGGACGTCGGGCCCCCTAGGTGAT-b** **ZI<sub>C</sub>**

**C.**

5' -CCTCGAGGTGACGGTATCGATAAGCTTGAT**TTGGGGTTGGGGTT**ATCGAATTCTGCAGCCGGGGATCCACTA-3' **QI<sub>W</sub>**  
3' -GGAGCTCCAGCTGCCATAGCTATTGAACTA**TTGGGGTTGGGGTT**TAGCTTAAGGACGTCGGGCCCCCTAGGTGAT-b **QI<sub>C</sub>**

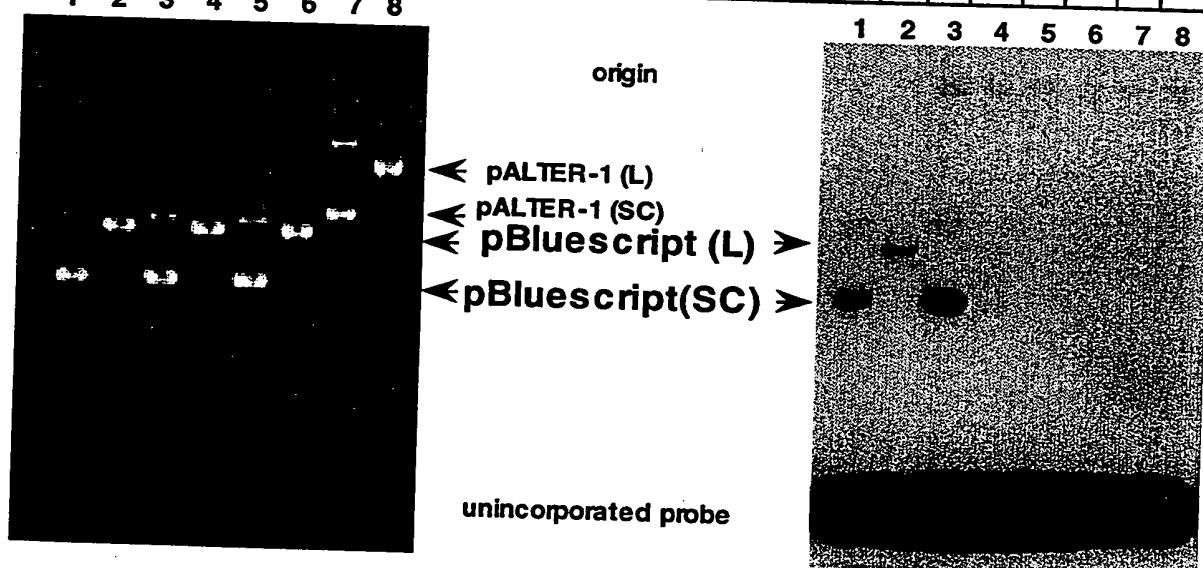
**FIGURE 10**



007240 "24b35650

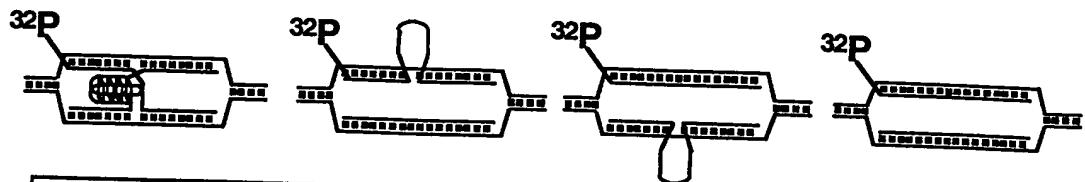
## FIGURE 11

+	+	-	-	+	+	+	+	+	second probe DNA strand	+	+	-	-	+	+	+	+
+	+	+	+	-	-	+	+	+	RecA protein	+	+	+	+	-	-	+	+
+	+	+	+	+	+	+	-	-	target homology	+	+	+	+	+	+	-	-
-	+	-	+	-	+	-	+	+	Scal linearization	-	+	-	+	-	+	-	+
1	2	3	4	5	6	7	8			1	2	3	4	5	6	7	8



**FIGURE 12**

**A.**



$^{32}\text{P}$ -labeled probe strand

unlabeled probe strand  
incubation at  
 $65^\circ\text{C}$  (min.)

lane

	$\text{QI}_w$				$\text{QI}_w$				$\text{NI}_w$				$\text{NI}_w$			
	$\text{QI}_c$				$\text{NI}_c$				$\text{QI}_c$				$\text{NI}_c$			
0	2	10	20	0	2	10	20	0	2	10	20	0	2	10	20	0
lane	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

origin



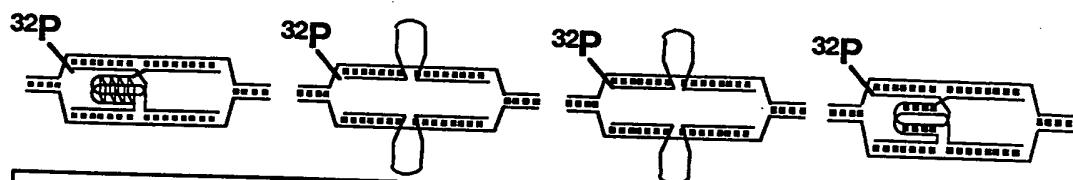
linear hybrid

unincorporated probe



## FIGURE 12

**B.**



## **<sup>32</sup>P-labeled probe strand**

## unlabeled probe strand

incubation at  
65°C (min.)

QI <sub>w</sub>	QI <sub>w</sub>	ZI <sub>w</sub>	ZI <sub>w</sub>
QI <sub>c</sub>	ZI <sub>c</sub>	QI <sub>c</sub>	ZI <sub>c</sub>
0 2 10 20	0 2 10 20	0 2 10 20	0 2 10 20
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16			

## origin

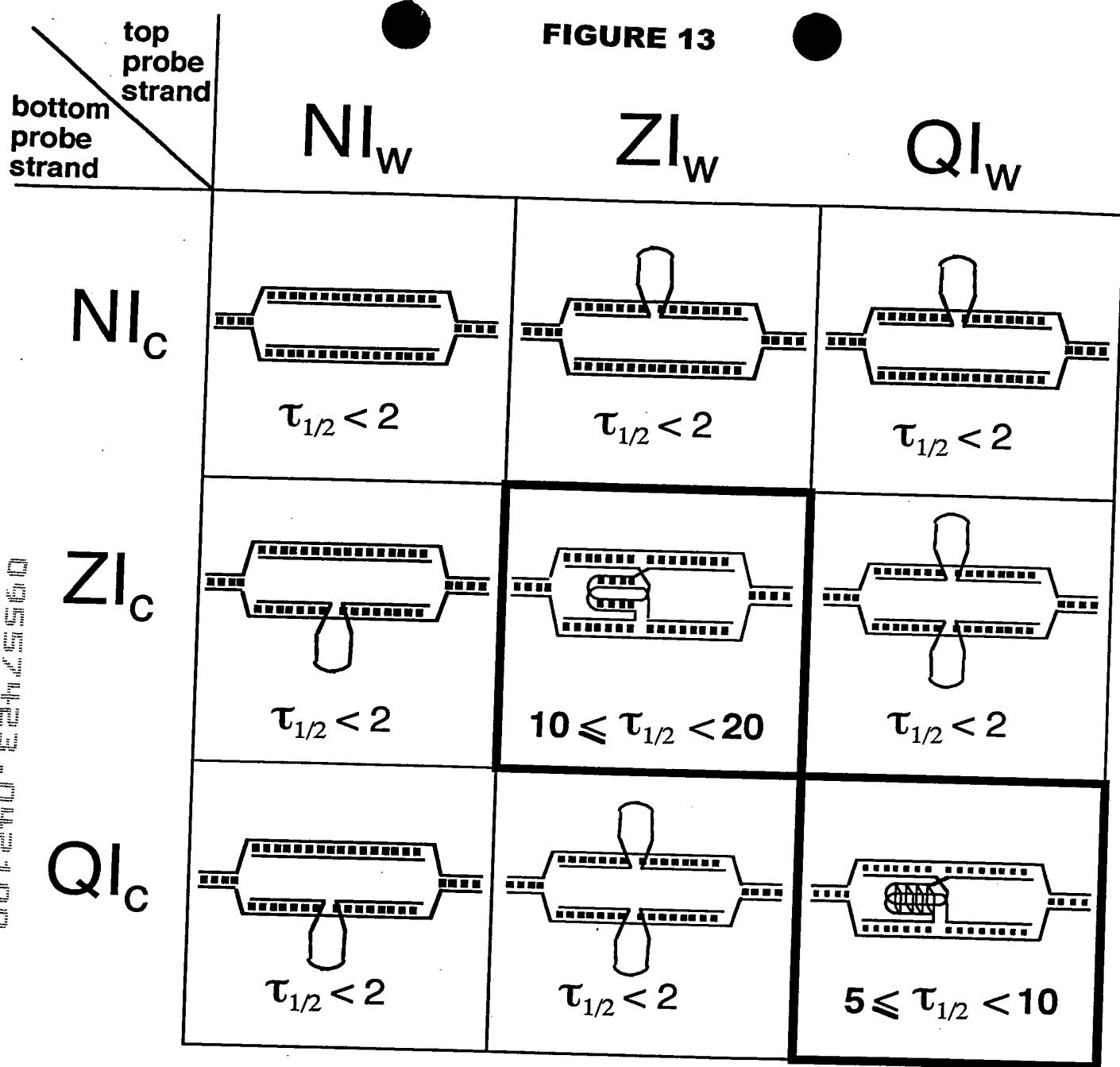
A dashed arrow pointing to the right, indicating a continuation or next step.

# linear hybrid ➤

sc

unincorporated  
probe

FIGURE 13



NI = No DNA Insert

ZI = Z-DNA forming Insert

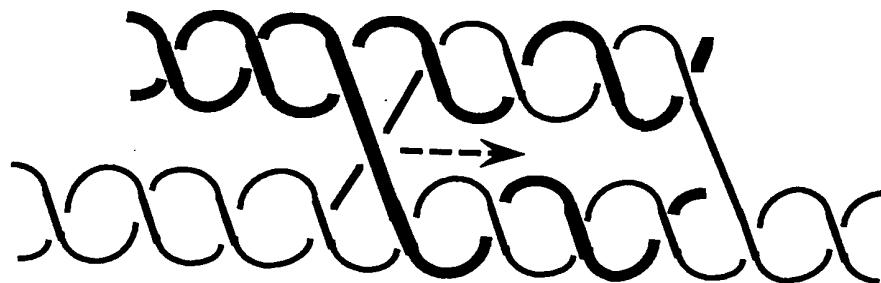
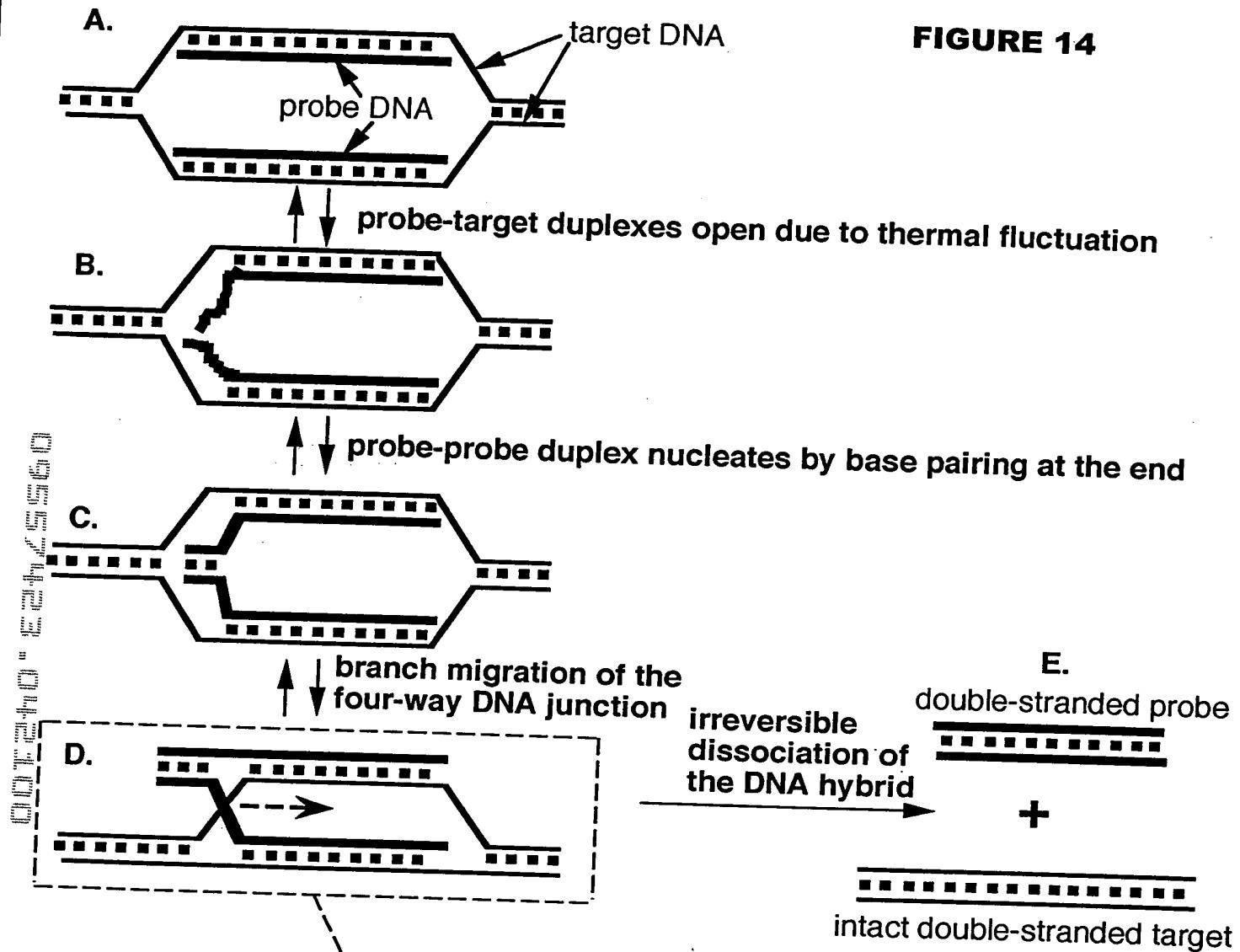
QI = Quadruplex-DNA forming Insert

w = Watson DNA strand

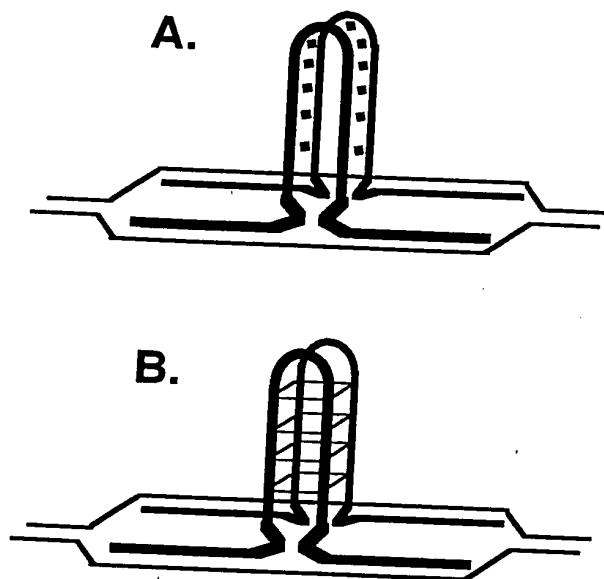
c = Crick DNA strand

$\tau_{1/2}$  = double D-loop DNA hybrid apparent half-life time (min.)

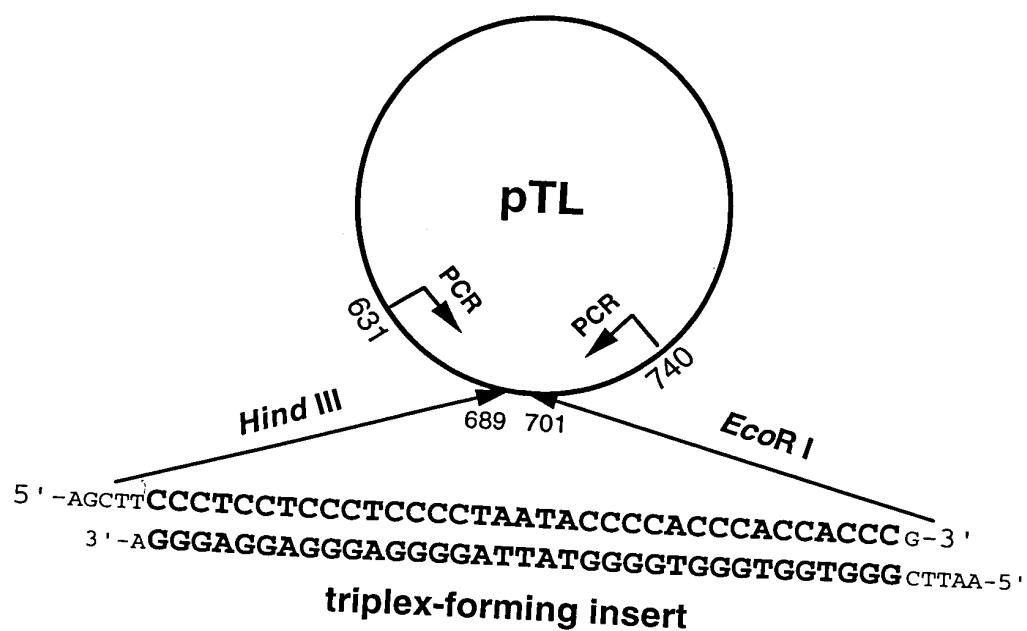
**FIGURE 14**



**FIGURE 15**

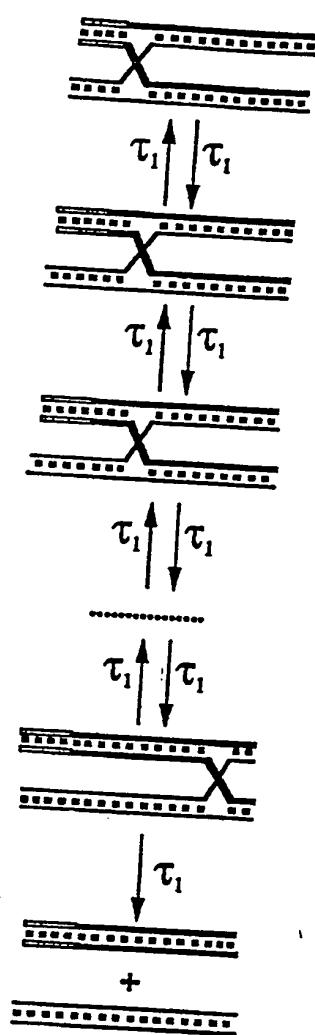


**FIGURE 16**

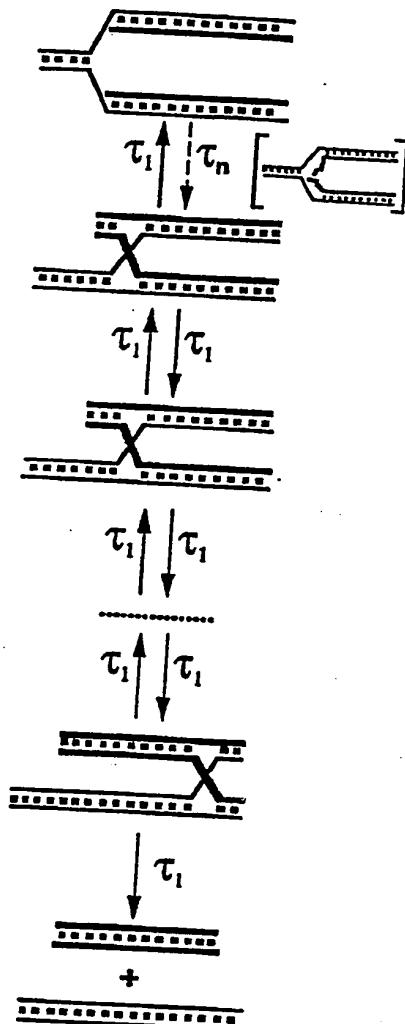


**FIGURE 17**

**A**



**B**



**C**

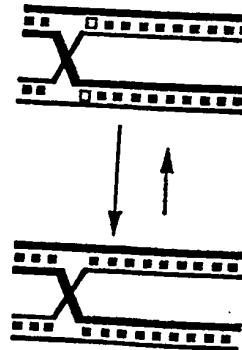
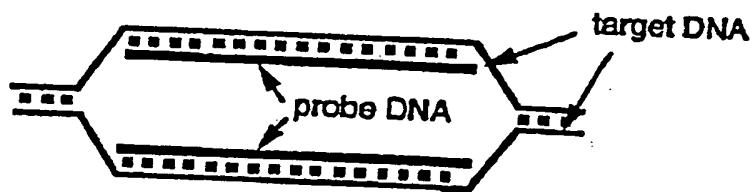
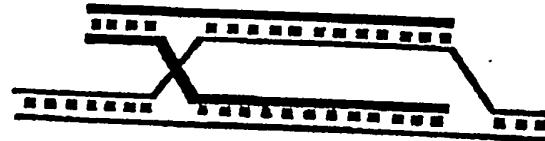


FIGURE 18

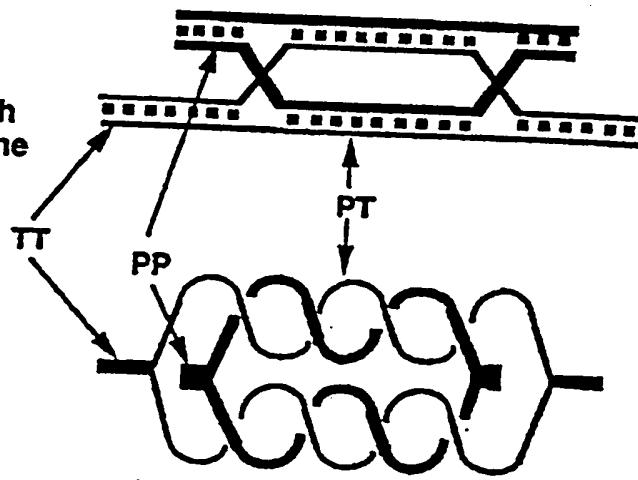
**A: Double D-loop DNA without nucleation of the probe-probe duplex**



**B: Double D-loop DNA with single nucleation (sn) of the probe-probe duplex**



**C: Double D-loop DNA with double nucleation (dn) of the probe-probe duplex**

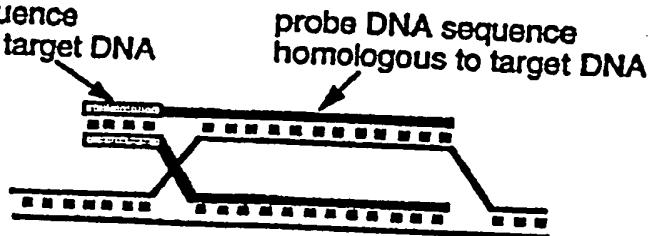


TT = target-target DNA duplex

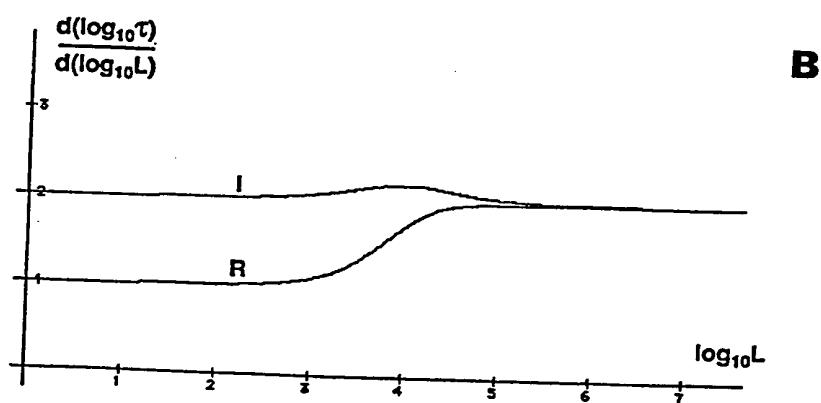
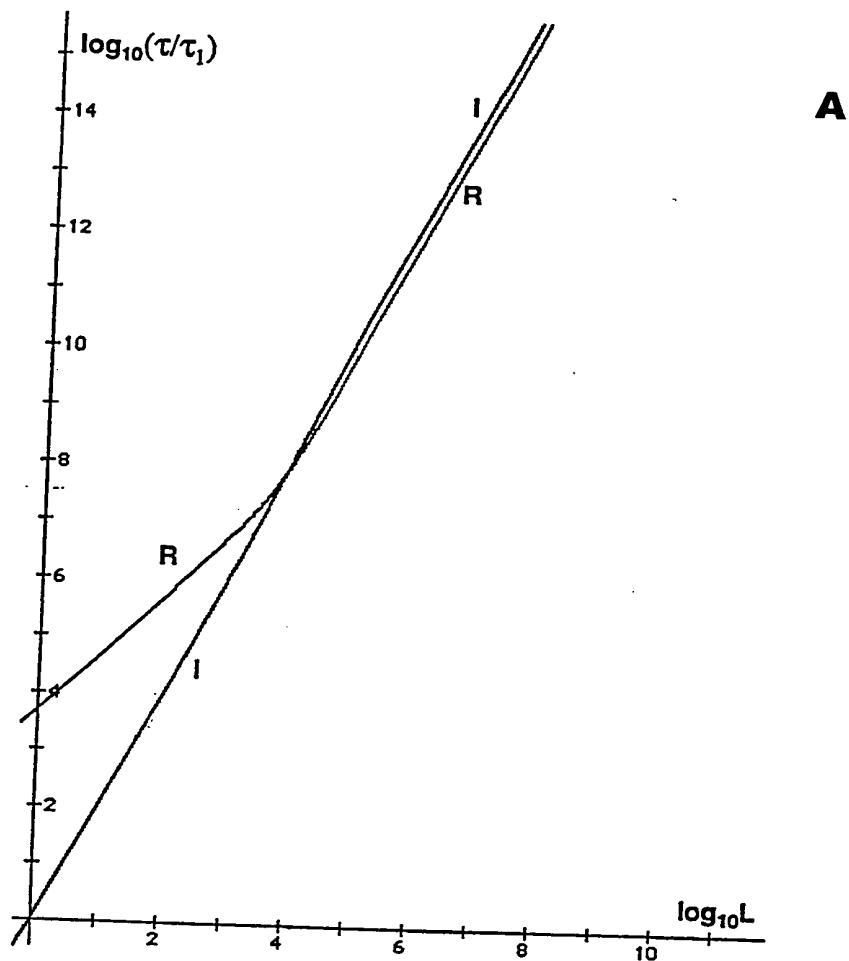
PP = probe-probe DNA duplex

PT = probe-target DNA duplex

**D: Double D-loop DNA with irreversible single nucleation of the probe-probe duplex at one end**



**FIGURE 19**



## FIGURE 20

